

**OPTICAL COMMUNICATIONS USING MULTIPLEXED SINGLE SIDEBAND
TRANSMISSION AND HETERODYNE DETECTION**

ABSTRACT OF THE DISCLOSURE

A transmitter subsystem generates an optical signal which contains multiple subbands of
5 information. The subbands have different polarizations. For example, in one approach, two or
more optical transmitters generate optical signals which have different polarizations. An optical
combiner optically combines the optical signals into a composite optical signal for transmission
across an optical fiber. In another approach, a single optical transmitter generates an optical
signal with multiple subbands. The polarization of the subbands is varied, for example by using
10 a birefringent crystal. In another aspect of the invention, each optical transmitter generates an
optical signal containing both a lower optical sideband and an upper optical sideband (i.e., a
double sideband optical signal). An optical filter selects the upper optical sideband of one optical
signal and the lower optical sideband of another optical signal to produce a composite optical
signal.